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EXAMINER  
ALEJANDRO MULERO, LUZ L

ART UNIT 1763  
PAPER NUMBER

DATE MAILED: 12/17/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/882,515

Applicant(s)

UHLENBROCK, STEFAN

Examiner

Luz L. Alejandro

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 29-56 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 29-56 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 June 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## **DETAILED ACTION**

### ***Drawings***

Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 33-56 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In all of the above mentioned claims, the use of the phrase "consisting essentially of" in the Markush groups renders the claims indefinite because the Markush group is not closed ended.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Art Unit: 1763

Claims 29-30 and 33-44 are rejected under 35 U.S.C. 102(a) as being anticipated by Admitted prior art.

Applicant admits on page 8-line 24 of the specification that Fig. 1 shows a conventional apparatus. The conventional apparatus consists of an apparatus capable of vaporizing and transporting precursor molecules to a chamber capable of depositing a thin film on a substrate, the apparatus comprising: a vessel 42 capable of containing an ionic liquid; a carrier gas source 44 in fluid communication with the vessel 42; a bubbler device capable of bubbling a carrier gas through the vessel; a chamber 10 capable of deposition in fluid communication with the carrier gas source 44; and a gas line 45 capable of transporting carrier gas and vaporized precursor molecules from the vessel to the deposition chamber (see page 10-line 22 of specification to page 11-line 21).

With respect to the vessel containing an ionic liquid or one of the specific chemical molecules listed in claims 33-44, these limitations are directed to method limitations rather than apparatus limitations. Since an apparatus is being claimed as the instant invention, the method teachings are not considered to be the matter at hand, since a variety of methods can be done with the apparatus. The method limitations are viewed as intended uses which do not further limit, and therefore do not patentably distinguish the claimed invention. The apparatus of the Admitted prior art is capable of having any of these ionic liquids in the vessel.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 31-32, 45-46, and 51-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Admitted prior art in view of Freemantle (C&EN).

Applicant admits on page 8, line 24 of the specification that Fig. 1 shows a conventional apparatus. The conventional apparatus consists of an apparatus capable of vaporizing and transporting precursor molecules to a chamber capable of depositing a thin film on a substrate, the apparatus comprising: a vessel 42 capable of containing an ionic liquid; a carrier gas source 44 in fluid communication with the vessel 42; a bubbler device capable of bubbling a carrier gas through the vessel; a chamber 10 capable of deposition in fluid communication with the carrier gas source 44; and a gas line 45 capable of transporting carrier gas and vaporized precursor molecules from the vessel to the deposition chamber (see page 10-line 22 of specification to page 11-line 21).

Admitted prior art fails to expressly disclose an ionic liquid source, specifically, an ionic liquid source as recited in claims 45-46 and 51-52. Freemantle discloses the use of ionic liquids in a variety of applications and also discloses wide ranging advantages of ionic liquids such as high thermal and chemical stability, large liquid temperature range, and no vapor pressure, for instance (see pages 32-33). Specifically, Freemantle

also discloses the ionic liquid sources of claims 45-46 and 51-52 (see the figure at bottom of page 32). In view of this disclosure, it would have been obvious to one of ordinary skill at the time the invention was made to modify the apparatus of the Admitted prior art so as to include an ionic liquid source in the precursor vessel because ionic liquids have the advantage of being nonvolatile, with no vapor pressure, a large liquid temperature range, and high chemical and thermal stability.

Claims 47 and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Admitted prior art in view of Freemantle (C&EN) as applied to claims 31-32, 45-46, and 51-52 above, and further in view of Blomgren et al., U.S. Patent 5,188,914.

Admitted prior art and Freemantle are applied as above but fail to expressly disclose the specific ionic liquid of claims 47 and 53. Blomgren et al. discloses the ionic liquid of claims 47 and 53 (see col. 2-line 49 to col. 3-line 5). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of the Admitted prior art modified by Freemantle so as to include the ionic liquid of Blomgren et al. depending upon the desired properties of the ionic liquid precursor and/or the particular process being conducted in the apparatus.

Claims 48 and 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Admitted prior art in view of Freemantle (C&EN) as applied to claims 31-32, 45-46, and 51-52 above, and further in view of Jones et al., U.S. Patent 4,839,249.

Admitted prior art and Freemantle are applied as above but fail to expressly disclose the specific ionic liquid of claims 48 and 54. Jones et al. discloses the ionic liquid of claims 48 and 54 (see col. 2-lines 45-55). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of the Admitted prior art modified by Freemantle so as to include the ionic liquid of Jones et al. depending upon the desired properties of the ionic liquid precursor and/or the particular process being conducted in the apparatus.

Claims 50 and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Admitted prior art in view of Freemantle (C&EN) as applied to claims 31-32, 45-46, and 51-52 above, and further in view of Abdul-Sada et al., WO 95/21872.

Admitted prior art and Freemantle are applied as above but fail to expressly disclose the specific ionic liquid of claims 48 and 54. Abdul-Sada et al. discloses the ionic liquid of claims 50 and 56 (see abstract). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of the Admitted prior art modified by Freemantle so as to include the ionic liquid of Abdul-Sada et al. depending upon the desired properties of the ionic liquid precursor and/or the particular process being conducted in the apparatus.

#### ***Allowable Subject Matter***

Claims 49 and 55 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all

Art Unit: 1763

of the limitations of the base claim and any intervening claims.


The following is a statement of reasons for the indication of allowable subject matter: the prior art, either singly or in combination, fails to anticipate or render obvious, the limitations of: the ionic liquid source of claims 49 and 55.

### **Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luz L. Alejandro whose telephone number is 703-305-4545. The examiner can normally be reached on Monday to Thursday from 7:30 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory L. Mills can be reached on 703-308-1633. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

  
Luz L. Alejandro  
Patent Examiner  
Art Unit 1763

December 16, 2002